



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/529,377

04/13/2005

Amir Ben-Shalom

P-9077-US

4570

49443 7590 07/21/2009
Pearl Cohen Zedek Latzer, LLP
1500 Broadway
12th Floor
New York, NY 10036

EXAMINER

CHOWDHURY, AFROZA Y

ART UNIT

PAPER NUMBER

2629

MAIL DATE

DELIVERY MODE

07/21/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/529,377	Applicant(s) BEN-SHALOM ET AL.	
	Examiner AFROZA Y. CHOWDHURY	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-45 and 47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-45 and 47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicants' amendment received on **April 3, 2009** has been entered. Claims 26-45 and 47 are currently pending. Applicants' arguments are addressed herein below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 26-35, 37, 40-45, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yuan et al.** (US Patent 6,317,189) in view of **Okumura et al.** (US Patent 5,796,447).

As to claim 26, Yuan et al. discloses a distinct color LCD apparatus including at least one layer of encapsulated cholesteric liquid crystal material (fig. 3(a(46)), col. 6, lines 39-42);

electrically conductive means (fig. 3(a(44))) for addressing a plurality of parallel addresses (col. 6, lines 27-30) across the encapsulated cholesteric liquid crystal material in the at least one layer (fig. 3(a), col. 6, lines 39-47);

Art Unit: 2629

and an electrical pulse driving means (fig. 3(a)-(f), col. 6, lines 42-47) connected to said electrically conductive means (fig. 3(a(44))) and arranged to supply drive signals to the plurality of parallel addresses to drive the cholesteric liquid crystal material selectively into a homeotropic (fig. 3(f), 6(f)) state or a planar (fig. 3(b), 6(b)) state (col. 9, line 66 – col. 10, line 12, col. 11, lines 20-33),

the electrical pulse driving means (fig. 3, 6(a)-(f), col. 6, lines 42-47) being arranged to supply drive signals which provide a predetermined grey level (fig. 5, col. 9, lines 9-30) by driving the cholesteric liquid crystal material, within predetermined time period, into homeotropic state (fig. 3(f), 6(f)) in a fraction of a predetermined time period (ON state, voltage is higher than intermediate voltage, col. 9, lines 52-58, col. 11, lines 5-13) and into the planar state (fig. 3(b), 6(b)) in the remainder of said time period, said fraction selected in accordance with the grey level (OFF state, col. 10, lines 34-42, col. 11, lines 20-33).

Yuan et al. does not specifically teach a distinct color LCD apparatus including successive frames each having a predetermined time period which is sufficiently short that an average reflectance of the color LCD apparatus over the predetermined time period is perceived without the appearance of visual flicker.

Okumura et al. teaches a distinct color LCD apparatus including successive frames each having a predetermined time period which is sufficiently short that an average reflectance of the color LCD apparatus over the predetermined time period is perceived without the appearance of visual flicker (col. 8, lines 50-65).

Art Unit: 2629

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to include the idea of Okumura et al. of suppressing the occurrence of flicker into the LCD device of Yuan et al. to make a distinct color LCD apparatus with high contrast and brightness.

As to claim 27, Yuan et al. teaches a distinct color LCD apparatus including a pair of glass plates on opposite sides of the at least one layer of encapsulated cholesteric liquid crystal material (fig. 3(a(42)), col. 6, lines 49-52).

As to claim 28, Yuan et al. teaches a distinct color LCD apparatus including a front plate made of glass (fig. 3(a(42)), col. 6, lines 49-52).

As to claim 29, Yuan et al. teaches a distinct color LCD apparatus including a back plate made of glass (fig. 3(a(42)), col. 6, lines 48-52).

As to claim 30, Yuan et al. discloses a distinct color LCD apparatus including a back plate made of a nonvolatile inert solid material (fig. 3(a), col. 6, lines 49-53).

As to claim 31, Yuan et al. teaches a distinct color LCD apparatus where the back plate is one selected from the group consisting of being colored black, being transparent (col. 6, lines 49-52) and being reflective (col. 6, lines 49-52, col. 10, lines

Art Unit: 2629

26-35).

As to claim 32, Yuan et al. discloses a distinct color LCD apparatus wherein the back plate is colored with a predetermined spectral bias selected to enhance color characteristics of the most proximate encapsulated cholesteric liquid crystal material in the at least one layer (col. 8, lines 16-30).

As to claim 33, Yuan et al. teaches a distinct color LCD apparatus including at least one "color" layer selected from the list: A. a black near ultra violet layer; B. a black near infra red layer; C. a black visible spectrum absorptive layer (col. 8, lines 16-30).

As to claim 34, Yuan et al. discloses a distinct color LCD apparatus where the electrically conductive means (figs. 3(a, c, e (44))) are arranged to generate an electric field (figs. 3(c), 3(e)) oriented substantially perpendicular across the at least one layer of encapsulated cholesteric liquid crystal material (col. 9, lines 58-62).

As to claim 35, Yuan et al. teaches a distinct color LCD apparatus wherein the electrically conductive means (fig. 3(a(44))) include ITO on facing surfaces of the at least one layer (col. 6, lines 48-52).

As to claim 37, Yuan et al. discloses a distinct color LCD apparatus where the electrical pulse driving means (fig. 3(a)-(f), col. 6, lines 42-47) is arranged to supply

Art Unit: 2629

drive signals which provide a predetermined grey level (col. 9, lines 13-21) by the drive signals being formed, in a number of predetermined portions into which time period is divided (ON state, voltage is higher than intermediate voltage, col. 11, lines 5-13 and OFF state, col. 10, lines 34-42), to drive the cholesteric liquid crystal material into the homeotropic state (fig. 6(f)) in a number of the portions and into the planar state (fig. 6(b)) in the remainder to the portions.

As to claims 40 and 41, Yuan et al. discloses a distinct color LCD apparatus including at least two said layers of encapsulated liquid crystal material maintained proximate to each other and in a substantially parallel orientation (fig. 3(a)).

As to claim 42, Yuan et al. teaches a distinct color LCD apparatus including an interstitial membrane between a pair of the at least two layers (col. 6, lines 34-42).

As to claim 43, Yuan et al. teaches a distinct color LCD apparatus where the cholesteric liquid crystal material of each one of the at least two layers reflects light of a respective color in the planar state (figs. 3(b), 6(b), col. 10, lines 36-53)).

As to claim 44, Yuan et al. discloses a distinct color LCD apparatus wherein said colors of the at least two layers include a combination selected from the list:

- A. a red layer and a green layer and a blue layer;
- B. a cyan layer and a magenta layer and a yellow layer;

Art Unit: 2629

- C. a red layer and a green layer;
- D. an orange layer and a blue layer;
- E. a yellow layer and a magenta layer. (col. 8, lines 23-27, fig. 5).

As to claim 45, Yuan et al. teaches a distinct color LCD apparatus where the electrically conductive means (figs. 3(a, c, e (44))) provides direct drive of each of said plurality of substantially parallel addresses (col. 6, lines 42-48)).

Claim 47 is rejected the same as claim 26 above.

4. Claims 36 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yuan et al.** (US Patent 6,317,189) in view of **Okumura et al.** (US Patent 5,796,447) and in further view of **Harada et al.** (US Patent 6,618,102).

As to claim 36, Yuan et al. (as modified by Okumura et al.) teaches a color LCD apparatus where cholesteric liquid crystal material dispersed between a pair of electrodes (col. 6, lines 24-53, in Yuan et al.).

Yuan et al. (as modified by Okumura et al.) does not teach whether the electrodes (conductors) are vapor deposited.

Harada et al. discloses production photoconductive layers using chemical vapor deposition (CVD) (col. 9, line 66 – col. 10, line 9).

Art Unit: 2629

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to use similar vapor deposition process as Harada et al. to produce the conductors that are facing surfaces of the at least one layer of the LCD apparatus of Yuan et al. (as modified by Okumura et al.) in order to maintain high purity.

As to claim 39, Harada et al. teaches a distinct color LCD apparatus where the electrical pulse driving means includes a controller for optimizing refresh time across an ensemble of the substantially parallel addresses (col. 5, lines 3-9).

5. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yuan et al.** (US Patent 6,317,189) in view of **Okumura et al.** (US Patent 5,796,447) and in further view of **Kim et al.** (US Patent 7,205, 970).

As to claim 38, Yuan et al. (as modified by Okumura et al.) teaches a color LCD apparatus where cholesteric liquid crystal material dispersed between a pair of electrodes (col. 6, lines 24-53, in Yuan et al.).

Yuan et al. (as modified by Okumura et al.) does not explicitly teach a LCD apparatus wherein the electrical pulse driving means is arranged to generate a waveform selected from the list: Alternating Current (AC), Balanced Direct Current (bDC), Time Balanced Modulated Charges (tbMC), combinations of the aforesaid, and any of the aforesaid within a predetermined decay envelope.

Art Unit: 2629

Kim et al. teaches a LCD apparatus wherein the electrical pulse driving means is arranged to generate a waveform selected from the list: Alternating Current (AC), Balanced Direct Current (bDC), Time Balanced Modulated Charges (tbMC), combinations of the aforesaid, and any of the aforesaid within a predetermined decay envelope (col. 5, lines 46-53).

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to incorporate the idea of Kim et al. of using different electric pulse driving means into the LCD apparatus of Yuan et al. (as modified by Okumura et al.) based on various types of LCD displays.

Response to Arguments

6. Applicant's arguments with respect to claims 26-45 and 47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AFROZA Y. CHOWDHURY whose telephone number is (571)270-1543. The examiner can normally be reached on 7:30-5:00 EST, 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
7/19/2009

/Bipin Shalwala/
Supervisory Patent Examiner, Art
Unit 2629